PALACE Drifters and the Global Cellular Network

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LONG-TERM GOAL

The long-term goal of this project is to design, build, and test a PALACE float that can use the Iridium and Orbcomm global communication networks.

OBJECTIVES

PALACE floats have been used in recent years to study the upper ocean circulation throughout the world ocean, and there are future plans for several large experiments using these floats. At present these instruments communicate using the ARGOS system. However, this system is very slow (data transfer rates of only a few bits per second), and only one-way communication is possible. Both the Iridium and Orbcomm systems appear to be promising successors to ARGOS, and the objective of this work is to build a prototype PALACE and Orbcomm floats capable of taking advantage of these new systems.

APPROACH

It was planned to build one or two floats that employ a prototype controller and communications module capable of using Iridium and Orbcomm. In order to do this, the present controller needs to be completely redesigned, new antennas must be chosen, and software must be written.

WORK COMPLETED

The Iridium system came on line on 1 November 1998 and is still not fully functional, owing to serious financial problems (the company is now in Chapter-11 bankruptcy proceedings). The company has said that it plans to turn on its data service (necessary to carry out this work) in October of 1999. As of this writing, this has not yet happened. We have been more successful in building a PALACE float capable of using the Orbcomm system. This float is nearly ready for testing, and will be deployed near Hawaii in January of 2000 from the R/V *Thomas G. Thompson.*

RESULTS

So far, we have tested the voice component of the Iridium system and have found that it is impossible to send data via this component. Thus, we can go no further with Iridium until the data system is turned on. We have been testing the components for the Orbcomm float for nearly a year now, on our dock in Seattle and on the roof of our building at UW. We believe that we now have a good design for

the use of Orbcomm with PALACE floats, and we hope to deploy a prototype in January of 2000 near Hawaii. It is necessary to carry out the deployment away from the continental US in order to test the "store and forward" capabilites of the Orbcomm system.

IMPACT/APPLICATION

PALACE floats have a good future as a tool for ocean exploration, and also in many applied areas such as ocean prediction. The instrument planned here will greatly improve our ability to carry out these tasks.

TRANSITIONS

None yet.

RELATED PROJECTS

I am funded by NSF to carry out a large deployment of PALACE floats in the N. Atlantic as part of the WOCE/ACCE project. Also, I have deployed 36 PALACEs in the Japan Sea with ONR funding in 1999. Additionally, I am on the ARGO Science Team, a group formed to plan the deployment of about 3000 PALACE floats over the globe beginning in 2000. Using Iridium and Orbcomm technology instead of ARGOS would be useful in all of these efforts.